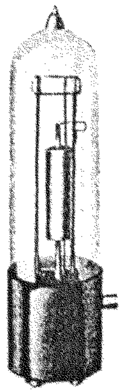
Western Electric

215A Vacuum Tube



Classification—Small, filamentary triode

Important features of the 215A tube are its small size and low filament power consumption.

Applications

Audio-frequency and intermediate-frequency amplifier

Detector

Oscillator

Dimensions—Dimensions, outline diagrams of the tube and base, and the arrangement of the electrode connections to the base terminals are shown in Figures 1 and 2.

Base—Small, four-terminal, bayonet base having silver contacts.

Socket—Four-contact, bayonet-slot type preferably provided with contact-metal contacts, such as the Western Electric 125B socket.

Mounting Positions—The 215A tube may be mounted in any position.

Average Direct Interelectrode Capacitances

Grid to plate	2.6 $\mu\mu$f.
Grid to filament	1.6 $\mu\mu$f.
Plate to filament	1.2 $\mu\mu$f.

Filament Rating

Filament current	0.25 ampere, d.c.
Nominal filament voltage	1.0 volt

The filament of this tube is designed to operate on a current basis and should be operated at as near the rated current as is practicable.

Characteristics—Plate current characteristics of a typical 215A tube are shown in Figure 3 as functions of grid voltage for several values of plate voltage. Corresponding amplification factor, plate resistance, and transconductance characteristics are given in Figures 4, 5 and 6, respectively. Plate current characteristics as functions of plate voltage are shown in Figure 7 for several values of grid voltage. The grid and plate voltages for all of these characteristics are measured from the negative end of the filament.

Operating Conditions and Output—Permissible operating conditions are included within the area, ABCD, in Figure 3. Amplification factor, plate resistance, transconductance, and performance data are given in the table on page 3 for a number of typical amplifier operating conditions represented by selected points within this area. Typical detector operating conditions for both plate current and grid current detection are also listed in the table. The less severe operating conditions should be selected in preference to maximum operating conditions wherever possible. The life of the tube at maximum conditions may be shorter than at less severe conditions.

The performance data include the fundamental power or voltage output and the second and third harmonic levels for the indicated values of load resistance and input voltage. The fundamental output is given in terms of the power, P_m, in milliwatts for values of load resistance, R, equal to and double the value of the plate resistance, r_p, and in terms of the voltage, E_{pm}, in peak volts for values of load resistance five times the plate resistance. The second and third harmonic levels, F_{2m} and F_{3m}, are given in decibels below the fundamental in each case. The peak value of the sinusoidal input voltage, E_{gm}, is numerically equal to the grid bias for each operating condition. For a smaller input voltage, E_g, the output and harmonic levels, except for the lowest values of third harmonic, are given approximately by the following relations:

$$P = P_m \left(\frac{E_g}{E_{gm}}\right)^2$$

$$E_p = E_{pm} \frac{E_g}{E_{gm}}$$

$$F_2 = F_{2m} + 20 \log_{10} \frac{E_{gm}}{E_g}$$

$$F_3 = F_{3m} + 40 \log_{10} \frac{E_{gm}}{E_g}$$

The level of the third harmonic in the 215A tube is usually low and may differ widely in individual tubes. The values given in the table are for a typical tube.

TABLE

Plate Voltage	Grid Bias	Plate Current	Amplification Factor	Plate Resistance	Transconductance	Input Voltage	Load Resistance	Power Output	Voltage Output	Second Harmonic	Third Harmonic
Volts	Volts	Milliamperes		Ohms r_p	Micromhos	Peak Volts	R	Milliwatts	Peak Volts	db	db
45.0	−3.0	1.0	5.7	16500	340	3.0	$R=r_p$	2.2		29	50
							$R=2r_p$	1.9		34	60
							$R=5r_p$		14.0	39	65
45.0	−1.5	1.6	5.8	14500	400	1.5	$R=r_p$	0.60		40	65
							$R=2r_p$	0.55		45	70
							$R=5r_p$		7.2	49	70
60.0	−3.0	2.0	5.7	13500	420	3.0	$R=r_p$	2.9		35	60
							$R=2r_p$	2.6		40	65
							$R=5r_p$		14.5	45	70
67.5	−6.0	1.4	5.6	15500	360	6.0	$R=r_p$	9.4		25	45
							$R=2r_p$	8.3		30	50
							$R=5r_p$		28.5	35	60
67.5	−4.5	2.0	5.7	14000	410	4.5	$R=r_p$	6.0		31	50
							$R=2r_p$	5.5		36	60
							$R=5r_p$		22.0	40	70
*67.5	−4.0	2.2	5.7	13500	420	4.0	$R=r_p$	5.0		34	55
							$R=2r_p$	4.5		38	60
							$R=5r_p$		19.5	43	70
*90.0	−8.0	2.2	5.6	14000	400	8.0	$R=r_p$	18		26	45
							$R=2r_p$	16		31	55
							$R=5r_p$		40.0	37	65
*100.0	−10.0	2.1	5.6	14500	390	10.0	$R=r_p$	26		24	35
							$R=2r_p$	23		29	40
							$R=5r_p$		47.0	36	40
22.5	−4.0	0.01	Plate current detection.								
45.0	−9.0	0.01									
67.5	−14.0	0.01									
22.5	+1.0	1.0	Grid current detection. Grid bias usually obtained by connecting grid return to positive end of filament.								
*45.0	+1.0	2.6									

*Maximum operating conditions

Microphonic Noise—With a plate voltage of 60 volts, a grid bias of −3 volts, and a load resistance of 100,000 ohms, the mean microphonic noise output level of the 215A tube, measured in a laboratory reference test set, is 27 decibels below 1 volt. The range of levels of individual tubes extends from 12 to 42 decibels. Since microphonic noise depends on the type and intensity of the mechanical disturbance which produces it, the values given here are useful chiefly for comparison with the levels of other tubes which have been tested in the same way.

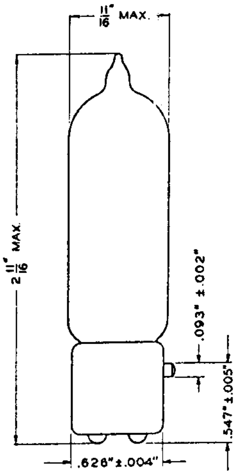


FIG. 1

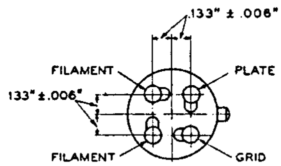


FIG. 2

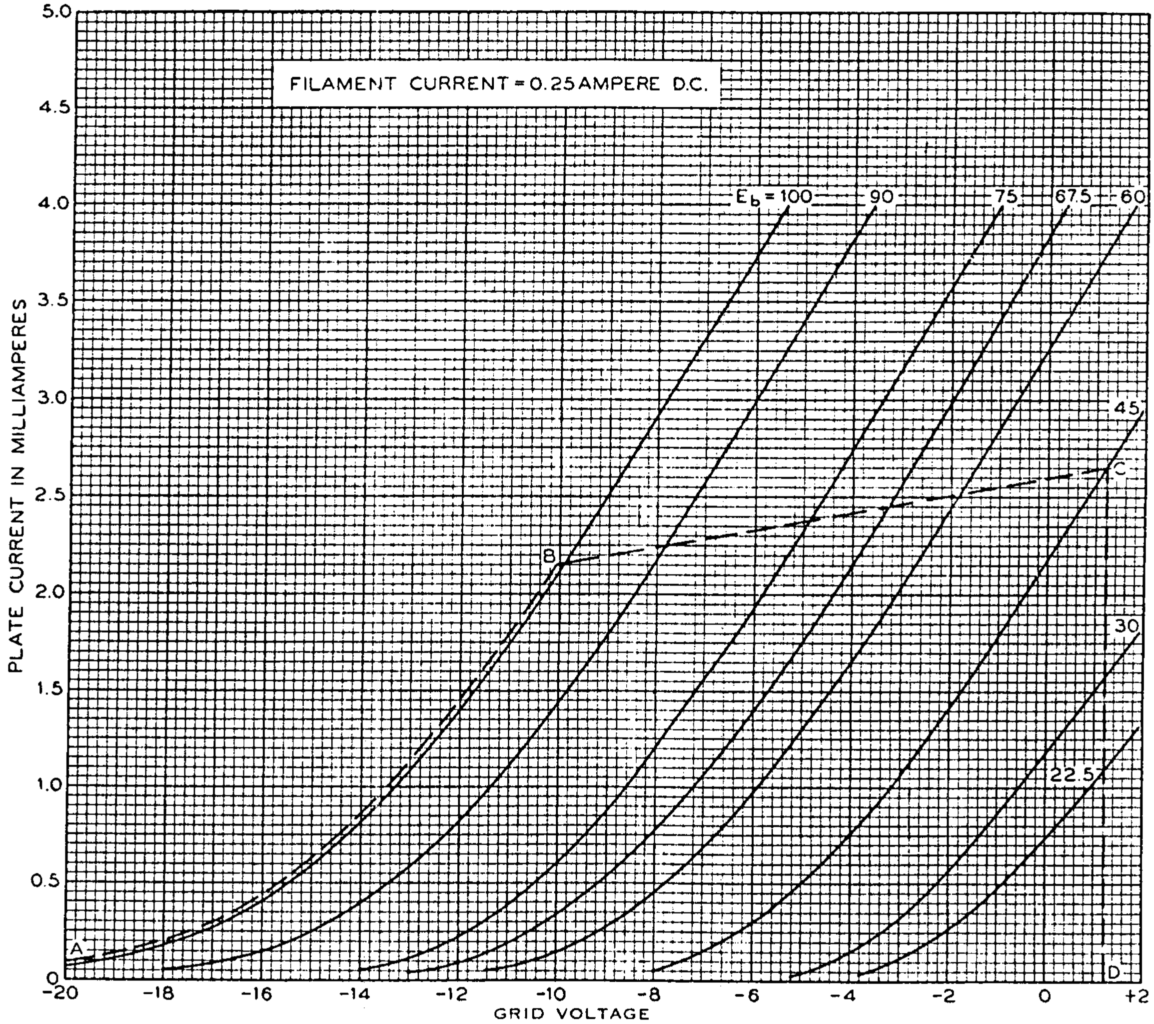


FIG. 3

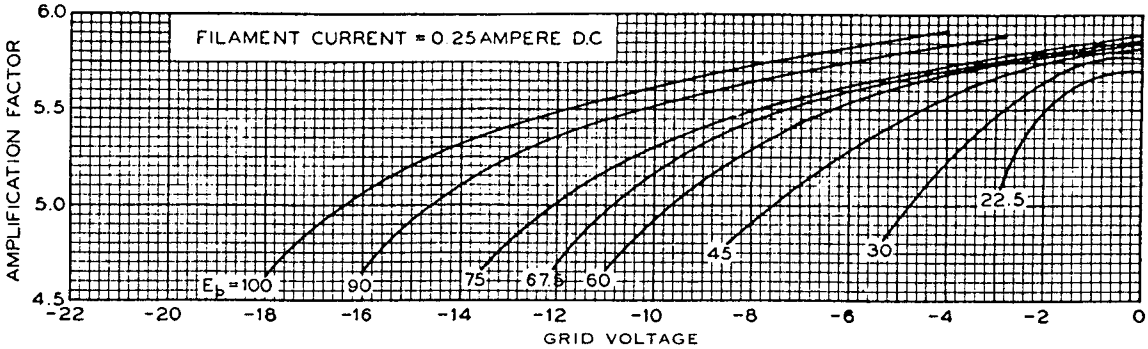


FIG. 4

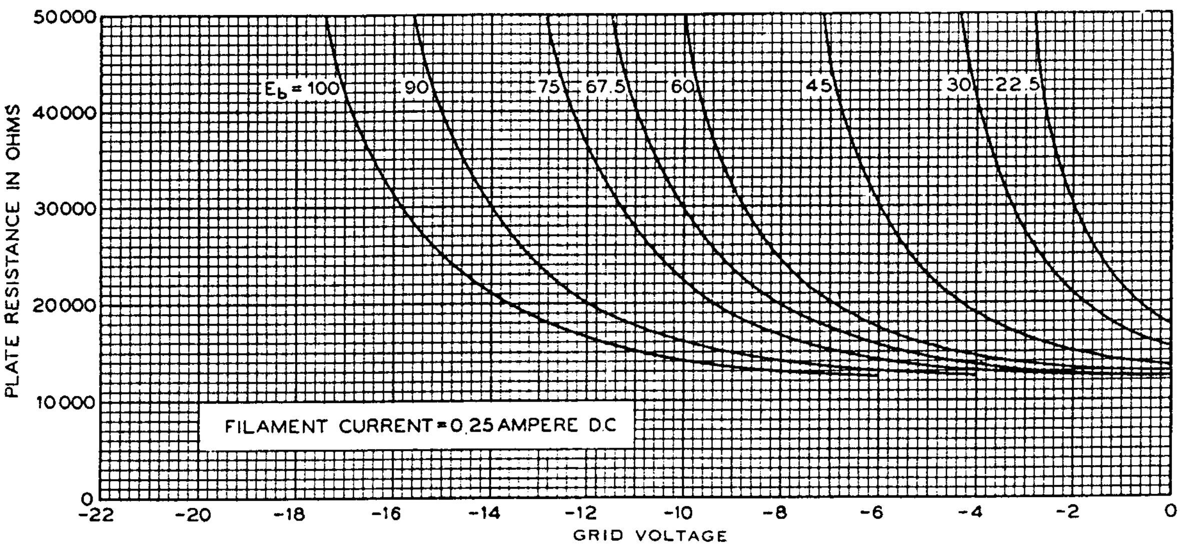


FIG. 5

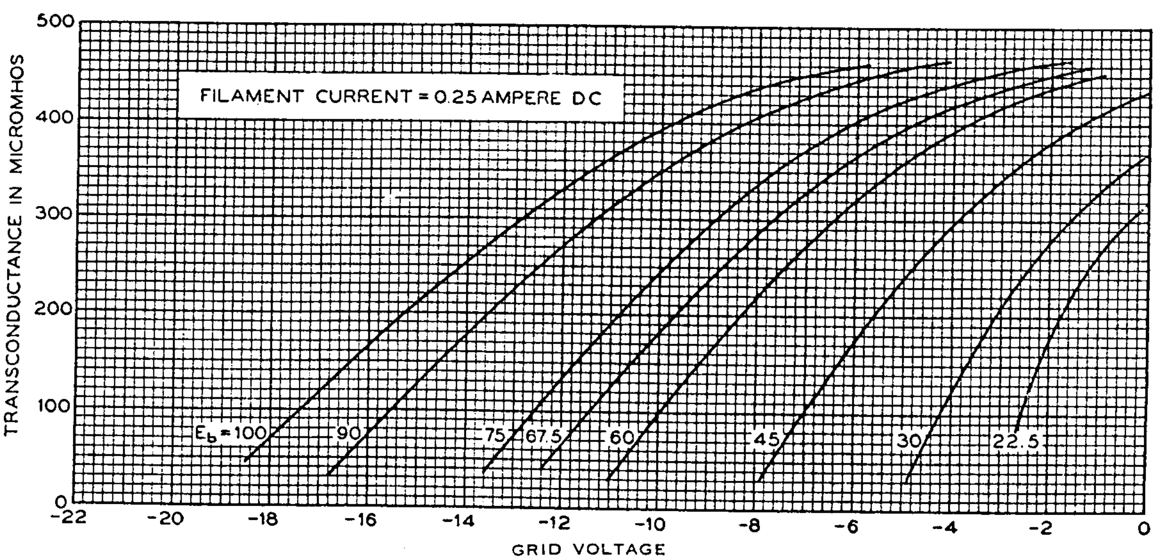


FIG. 6

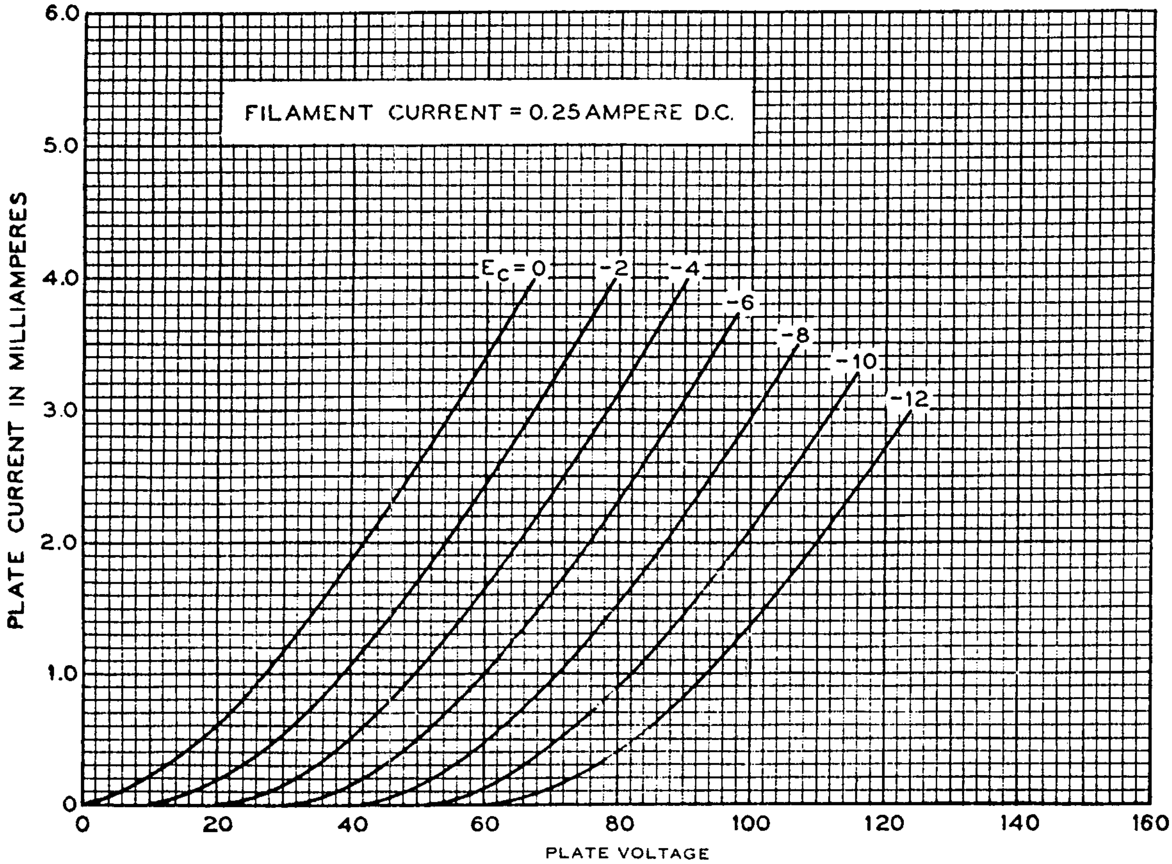

FILAMENT CURRENT = 0.25 AMPERE D.C.
E_C = 0
-2
-4
-6
-8
-10
-12
PLATE CURRENT IN MILLIAMPERES
6.0
5.0
4.0
3.0
2.0
1.0
0
0
20
40
60
80
100
120
140
160
PLATE VOLTAGE

FIG. 7